

GCSE

COMBINED SCIENCE: TRILOGY

8464/P/2F: Paper 2 - Physics (Foundation tier)
Report on the Examination

8464
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General

This was the first full series since 2019. There was an increase in the number of candidates, but the general standard of the responses was broadly in line with that of 2019. It was noticed that students had benefitted from the advance information and from being given the equations.

The calculations were well answered. The vast majority of students could complete the low demand calculations with ease. Most also did quite well on the standard demand calculations. Questions that required practical knowledge and understanding or skills, were not well answered. Most students were unable to demonstrate any practical experience.

Questions that required extended response were quite well answered. Students would benefit from more experience of interpreting data.

Levels of demand

Questions are set at two levels of demand for this paper:

- **low demand** questions are designed to broadly target grades 1–3.
- **standard demand** questions are designed to broadly target grades 4–5.

A student's final grade, however, is based on their attainment across the qualification as a whole, not just on questions that may have been targeted at the level at which they are working.

Question 1 (Low demand)

- 01.1** A little over 70% of students knew that waves transfer energy.
- 01.2** Nearly all students scored a mark on this question comparing electromagnetic waves, with approximately two thirds scoring both marks.
- 01.3** 50% of students could name either visible light or gamma - of those that did only score one mark, gamma was the most common correct answer. Less than 25% of students scored 2 marks.
- 01.4** Over 95% of students scored at least one mark on this question. 65% scored two marks, with most that did failing to identify the correct use of microwaves. Approximately 15% of students scored all three marks.

Question 2 (Low demand)

- 02.1** Approximately 40% of students were able to suggest a way to reduce the risk of burning. Many incorrect answers suggested wearing gloves – unqualified, this is insufficient, as some gloves would not offer any protection. Other incorrect answers were impractical, such as full insulation suits.
- 02.2** This question on describing a practical was reasonably well answered. Over two thirds of students wrote answers that contained relevant content and scored marks. The answers that failed to make it into level two did not describe the use of all the equipment, or were vague, suggesting using measuring the temperature, but not stating that this is done using the thermometer. Many answers failed to include the use of the measuring cylinder. 25% of students' answers were judged to be in level two, so their methods would have led to a valid outcome
- 02.3** Over 75% of students were able to describe the power decreasing as the time increased. Very few students were able to describe the amount power decreased each minute getting less, as only approximately 5% of students were awarded 2 marks.
- 02.4** Approximately 50% of students were able to interpret the data and identify the most likely value for the power.
- 02.5** Only 20% of students were able to give an advantage of the Leslie Cube. Most answers were very vague with simple statements like 'it's easier'.
- 02.6** Approximately 45% of students scored at least one mark on this question. The most common correct answer was 'more accurate'. 5% of students scored two marks on this question.

Question 3 (Low demand)

- 03.1** The vast majority of students were unaware that the arrow should be drawn from the centre of mass. The majority of students just labelled the apple 'weight'.
- 03.2** 90% of students were able to correctly calculate the weight.
- 03.3** 60% of students knew that the resultant force on the stationary apple was zero.
- 03.4** 80% of students knew that the resultant force on the accelerating apple was downwards.
- 03.5** A little over 75% of students calculated the time correctly. A significant number of students substituted the numbers incorrectly and arrived at an answer of 2.

Question 4 (Low demand)

- 04.1** 65% of students knew that the compass always points in the same direction due to the Earth's magnetic field.
- 04.2** Only 33% of students knew that steel was the only magnetic material given. Aluminium was the most popular answer.
- 04.3** 50% of students knew that the field was strongest at the ends of the coil.
- 04.4** Approximately 5% of students scored 2 marks. 25% of students were able to score 1 mark for drawing 2 or 3 arrows in the correct direction.
- 04.5** Nearly 40% of students scored 1 mark on this question, but only approximately 10% of students scored 2 marks. Most students answered who did not score any marks referred to a stronger magnet.

Question 5 (Low and standard demand)

- 05.1** 65% of students scored 2 marks, and 85% scored at least 1 mark, for identifying the factors affecting thinking distance.
- 05.2** 50% of students were able to correctly state that there would be an increased risk of a collision. Very few were able to explain why. Approximately 10% identified that the reaction time would increase, but very few explained that this would increase the thinking distance.
- 05.3** 60% of students were able to read the correct value from the graph. Of those that did not, most read from the wrong axis.
- 05.4** A minority of students described the relationship as directly proportional. Fewer than half of students were able to state that as speed increases thinking distance increases.
- 05.5** Fewer than 10% of students scored any marks for drawing the line on the graph. 30% of students did not attempt to answer the question.
- 05.6** 20% of students scored some marks. This was a standard demand question due to the initial velocity being zero. Most students appeared to be confused by $v^2 = 450$ and either squared 450, or wrote 450 as their final answer.

Question 6 (Standard demand)

- 06.1** Of the 60% of students that scored marks on this question the vast majority were able to identify the wavelength for 1 mark but were not able to identify the rarefaction.
- 06.2** 60% of students scored 2 marks on this question. Only 5% of students performed the conversion from kHz to Hz. Very few students gave the correct unit.
- 06.3** Nearly 90% of students were able to select the correct equation.
- 06.4** The majority of students did not appear to understand what was required to answer this question. The vast majority of those that did understand what was required scored full marks, with 20% of students awarded four marks. Some students did read the correct value from the graph, but then wrote that as their final answer. Many students just multiplied 200 by 28.

Question 7 (Standard demand)

- 07.1** Nearly 90% of students were able to write down the correct equation.
- 07.2** This was a relatively straightforward calculation. However, it was not attempted by nearly 20% of students, and only approximately 50% of students gained full marks.
- 07.3** Nearly 90% of students were able to select the correct equation.
- 07.4** This calculation was well answered with 75% of students gaining full marks.
- 07.5** This extended response question was well answered. 70% of students were able to write responses worth some credit, with most stating that the competitors may get tired. Of the students that did not get into level 2, most gave reasons why the speed may change, but did not link this to an increase or decrease in speed.

Use of statistics

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.